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Omalu e-mail to Hamilton and DeKosky. **How naive they had been:** Interviews with Omalu, Hamilton, and DeKosky, 2012.

CHAPTER 9

Paper Number 5: Elliot J. Pellman et al., "Concussion in Professional Football, Part 5," *Neurosurgery*, Nov. 2004. **A number of conclusions:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 5," *Neurosurgery*, Nov. 2004. **Confidential documents:** The NFL produced the documents on Oct. 28, 2004, in response to discovery requests for "all other benefit claims for TBD (total and permanent disability) in which the Plan participant has asserted that: (1) the claim is based on mental disability, and (2) the mental disability was alleged to have resulted from repetitive trauma to the head or brain from League football activities." The NFL listed 11 such claims (besides Webster's) and produced incomplete case histories for several. The players' names were blacked out. It is impossible to tell from the documents the total number of players who received benefits from the NFL on the basis of claims of mental disability related to football. **One was Gerry Sullivan:** Sullivan's case history shows that he was awarded benefits for both mental and orthopedic disabilities. An independent psychiatrist determined that Sullivan was totally and permanently disabled "due to cognitive impairment and behavioral disinhibition." A neurologist brought in by the NFL disagreed. The retirement board granted benefits on the basis of the reports of the psychiatrist and an orthopedist. **The appellate court:** *Jani v. Bert Bell/Pete Rozelle NFL Player Retirement Plan*, Fourth Circuit Court of Appeals, unpublished opinion, Dec. 13, 2006. **So far as to declare:** David C. Viano et al., "Concussion in Professional Football, Part 10," *Neurosurgery*, Dec. 2005. **"Virtually worthless":** "Study of Ex-NFL Players Ties Concussion to Depression Risk," *New York Times*, May 31, 2007. **Numerous studies:** J. S. Delaney et al., "Concussion during the 1997 Canadian Football League Season," *Clinical Journal of Sports Medicine*, 2000; J. S. Delaney et al., "Concussions among University Football and Soccer Players," *Clinical Journal of Sports Medicine*, 2002. **At his alma mater:** Guskiewicz brought up the NFL midway through his commencement speech to emphasize the need for "perseverance, surrounding yourself with good people, and carefully making decisions." He said: "In 2005 and 2007, I published (along with a group of 5 colleagues) two research papers that have defined my career as a neuroscientist. The findings of my research outlined in these papers appeared to be incriminating toward arguably one of the most popular and profitable industries in America—professional football, yes—the NFL. Our four-year study identified a high probability of developing later life cognitive impairment and depression once a player had sustained 3 or more concussions during their NFL career. It was the last thing the NFL wanted to hear, and the league's own medical committee immediately began dismissing our findings and trying to hire other doctors and scientists to 'put out the fire.' The NFL was in damage control mode. Its committee members began pointing fingers at our research and even initiated its own study. This was 'industry-funded research' at its

best. Members of the league's committee even suggested that we were out to ruin the game of football. It was a difficult time for our group, because we knew our research was solid, and we refused to be intimidated and just walk away. The irony of this is that my 3 boys were playing Pop Warner Football at the time, and if I wanted to paint this ugly picture of the game—would I really allow my own children to participate in the sport? All along, we had claimed that our goal was to identify risk factors for concussion and long-term effects to help improve the game and to help preserve the sport of football." **Protector of the league:** Bob Cantu interview, 2012. **Conclusions of NFL Paper Number 6:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004. **The response:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004 (comments). **A lark:** Bill Barr interview, 2012. **Coauthored a chapter:** Mark R. Lovell and William Barr, "American Professional Football," *Traumatic Brain Injury in Sports*, pp. 209–219. **Madison Square Garden:** Barr interview, 2012. **He was incredulous:** Barr interview, 2012. **Pellman later denied:** "Doctor Yes," *ESPN The Magazine*, Oct. 28, 2006. **Barr began to contact:** Barr e-mail correspondence with Rick Naugle, Chris Randolph, and John Woodward. **This was false:** "Doctor Yes," *ESPN The Magazine*, Oct. 28, 2006. **Lovell denied:** Mark Lovell interview. **Maroon seemed taken aback:** Pellman et al., "Concussion in Professional Football, Part 6," *Neurosurgery*, Dec. 2004 (comments). **A letter to his dean:** Letter from Barr to Richard I. Levin, Vice Dean for Education, Faculty and Academic Affairs, NYU School of Medicine, April 29, 2005. **Five papers in as many months:** "Concussion in Professional Football," Parts 4–8, ran monthly between Oct. 2004 and Feb. 2005 in *Neurosurgery*. Committee members told the authors that the NFL project evolved into a series of 16 papers but that no specific number was originally planned. **Concussions were so minor:** Elliot J. Pellman et al., "Concussion in Professional Football, Part 7," *Neurosurgery*, Jan. 2007. **"Concussion prone":** Elliot J. Pellman et al., "Concussion in Professional Football, Part 12," *Neurosurgery*, Feb. 2006. **For \$500,000:** "NFL Helmet Manufacturer Warned on Concussion Risk," *Frontline*, May 1, 2013. This article, written by Sabrina Shankman, was part of a reporting partnership between *Frontline* and ESPN's *Outside the Lines*. The original article can be found at pbs.org/wgbh/pages/frontline/sports/concussion-watch/nfl-helmet-manufacturer-warned-on-concussion-risk; and espn.go.com/espn/otl/story/_/id/9228260/report-warned-riddell-no-helmet-prevent-concussions-nfl-helmet-maker-marketed-one-such-anyway/. **A confidential report:** Report from Chris Withnall, senior engineer, Biokinetics, prepared for Riddell Inc., Nov. 15, 2000. **"Full stop":** *Frontline*, May 1, 2013. **Riddell provided the helmets:** Mark Lovell interview, 2012. **Collins, who led the study:** Micky Collins et al., "Examining Concussion Rates and Return to Play in High School Football Players Wearing Newer Helmet Technology: A Three-Year Prospective Cohort Study," *Neurosurgery*, Feb. 2006. **A blistering commentary:** Micky Collins et al., "Examining Concussion Rates and Return to Play in High School Football Players Wearing Newer Helmet Technology: A Three-Year Prospective Cohort Study," *Neurosurgery*, Feb. 2006 (comments).

CHAPTER 10

Apuzzo continued to rubber-stamp: Cantu, the section editor, said other peer reviewers were recruited to evaluate the papers after he and Guskiewicz refused; the publication of the NFL concussion series continued until just before the MTBI committee was disbanded. **Agreed to publish Omalu's paper:** Omalu e-mails. **Support Cantu's theory:** Cantu interview, 2012. **The torturous review process:** Omalu e-mails and interview, 2012. **An original version:** Omalu and Hamilton e-mails. **The paper was published:** Bennet I. Omalu et al., "Chronic Traumatic Encephalopathy in a National Football League Player," *Neurosurgery*, July 2005. **Donald Marion:** Omalu interview, 2012; Hamilton e-mails; Donald Marion interview, 2012. **Omalu wrote to his colleagues:** Omalu e-mail to DeKosky and Hamilton. **The NFL's letter:** Ira R. Casson, Elliot J. Pellman, and David C. Viano, "Correspondence," *Neurosurgery*, May 2006. **A shot of Johnnie Walker Red:** Omalu interview, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **He did some quick research:** Omalu interview, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **Omalu e-mailed:** Hamilton e-mails. **Hamilton wasn't at all amused:** Hamilton interview, 2012, and e-mails. **The men exchanged e-mails:** Hamilton e-mails. **Dug further into the history:** Omalu, Hamilton, and DeKosky interviews, 2012. **He had discovered another case of CTE:** Omalu, Hamilton, DeKosky, and Wecht interviews; Hamilton e-mails. **Terry Long killed himself:** Long autopsy report. **Long was like Webster:** Long biography from ProFootball Reference.com; Bailes interview, 2012; "Long, Terrence L," *TribLive*, obituaries; and "Long Carries His Weight with Steelers," *Pittsburgh Press*, Aug. 6, 1985. **Tested positive for steroids:** "Long's Road Back," *Pittsburgh Post-Gazette*, Dec. 4, 1991. **Dramatic downward spiral:** Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*; "Final Days Were Troubled for Former Steeler," *Pittsburgh Post-Gazette*, June 10, 2005. **"Ground Zero":** "Heads Up," *Pittsburgh Post-Gazette*, Sept. 7, 2000. Upon launching the UPMC concussion program, Micky Collins told Chuck Finder: "What we really want to do is make Pittsburgh ground zero." **The autopsy:** Dr. Abdulrezak Shakir interview, 2012; Long autopsy; Omalu interview, 2012. **Omalu repeated the process:** Bennet I. Omalu et al., "Chronic Traumatic Encephalopathy in a National Football League Player: Part II," *Neurosurgery*, Nov. 2006. **Omalu sent the slides to Hamilton:** Omalu and Hamilton interviews, 2012; Hamilton e-mails. **He went straight to the media:** "Wecht: Long Died from Brain Injury; Had Head Trauma from NFL Days," *Pittsburgh Post-Gazette*, Sept. 14, 2005. **The NFL responded swiftly:** "Surgeon Disputes Findings; Disagrees with Wecht That Football Killed Long," *Pittsburgh Post-Gazette*, Sept. 15, 2005. **Wecht called Omalu at home:** Omalu and Wecht interviews, 2012. **A 1987 letter written by Maroon:** "Cause of Death Sparks Debate," *Pittsburgh Post-Gazette*, Sept. 16, 2005. **Even more confusing:** "Suicide Ruling in Long's Death Hasn't Ended Controversy," *Pittsburgh Post-Gazette*, Jan. 26, 2006. **Finishing touches:** Hamilton e-mails. **Omalu, Hamilton, and DeKosky wrote:** Bennet I. Omalu et al., "Correspondence," *Neurosurgery*, May 2006. **Published the Long study six months later:** Bennet I. Omalu et al.,

"Chronic Traumatic Encephalopathy in a National Football League Player: Part II," *Neurosurgery*, Nov. 2006. **The phone rang at Omalu's desk:** Omalu and Bailes interviews, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*, 2008. **Bailes told Omalu:** Bailes and Omalu interviews, 2012. **One of Cantu's former patients:** Chris Nowinski and Omalu interviews, 2012; Omalu, *Play Hard, Die Young: Football Dementia, Depression, and Death*. **A new breed of Dissenter:** Nowinski biography from Nowinski interview, 2012; Christopher Nowinski, *Head Games: Football's Concussion Crisis*. **Killer Kowalski's Pro Wrestling School:** www.killerkowalskis.com. **"A dynamic individual":** Cantu interview, 2012. **Nowinski was checking SI.com:** Nowinski interview, 2012. **Andre Waters:** Biography from ProFootballReference.com; "Pro Football's Necessary Headaches to NFL Players," *Philadelphia Inquirer*, Oct. 30, 1994. **Nowinski played a hunch:** Nowinski interview, 2012. **While trying to get his book published:** Nowinski and Alan Schwarz, *The Numbers Game: Baseball's Lifelong Fascination with Statistics*, 2005. **The story on the Waters results:** This account of the background on how the Andre Waters story developed is drawn from 2012 interviews with Schwarz, Nowinski, and Omalu. **Waters had brain damage:** "Expert Ties Ex-Players' Brain Damage to Football," *New York Times*, Jan. 18, 2007. **When Bailes contacted Omalu:** Bailes and Omalu interviews, 2012. **Omalu and Maroon had struck a truce:** Omalu and Maroon interviews, 2012; Hamilton e-mails. **Gathered in Hamilton's office:** This account of the meeting is drawn from 2012 interviews with Omalu, Bailes, Hamilton, DeKosky, and Maroon.

CHAPTER 11

Profoundly affected: Harry Carson interview, 2012. **"Dick in the dirt":** Harry Carson, *Captain for Life*, p. 209 (electronic). **No player had hit him harder:** Harry Carson, *Captain for Life*, p. 184 (electronic). He confessed: Carson interview, 2012. **He went back:** "Two Authors of N.F.L. Study on Concussions Dispute Finding," *New York Times*, June 10, 2007. **Riddell developed PowerPoint presentations:** A history of the controversial Revolution helmet study, Riddell's marketing strategy, and the relationship between Riddell and ImPACT is summarized in a partial opinion issued in Riddell's lawsuit against Schutt. The court established a series of "undisputed facts," which included the findings that Riddell provided salary support for Collins and Lovell; ImPACT agreed not to sell concussion software at "any places in conflict with Riddell"; ImPACT agreed to pay Riddell for any sale "completed through a Riddell initiated contact"; and data compiled in 2002 and 2003, the first two years of the three-year study, produced "nearly identical concussion rates" in Year 1 and a difference that was "not statistically significant" in Year 2. The opinion granted Riddell summary judgment to toss out Schutt's claims that Riddell falsely advertised the concussion-reducing properties of the Revolution helmet. Schutt "has failed to identify literally false statements or show that it has been harmed by plaintiff statements," Judge Barbara B. Crabb wrote. See *Riddell*,

Inc. v. Schutt Sports, Inc. **The two pieces ran:** "I don't want anyone to end up like me"; Plagued by postconcussion syndrome and battling an amphetamine addiction, former Patriots linebacker Ted Johnson is a shell of his former self," *Boston Globe*, Feb. 2, 2007; and "Dark Days Follow Hard-Hitting Career in N.F.L.," *New York Times*, Feb. 2, 2007. The main difference in the two pieces was MacMullan's revealing interview with Belichick. The Patriots' coach declined comment to the *Times*. **"88 Plan":** "Wives United by Husbands' Post-N.F.L. Trauma," *New York Times*, March 14, 2007. **"Many elderly people":** *New York Times*, March 14, 2007. **1982 study:** Ira R. Casson et al., "Neurological and CT Evaluation of Knocked Out Boxers," *Journal of Neurology, Neurosurgery, and Psychiatry*, 1982. **Sports Illustrated brought in Casson:** Robert Boyle and Wilmer Ames, "Too Many Punches, Too Little Concern," *Sports Illustrated*, April 11, 1983. **In a 2010 article:** Ira R. Casson, "Do the 'Facts' Really Support an Association between NFL Players' Concussions, Dementia and Depression?" *Neurology Today*, June 3, 2010. **Goldberg said he walked away thinking:** Bernard Goldberg interview, 2013. **Inherited a nightmare:** Bob Stern interview, 2013. **After taking office:** Don Van Natta Jr., "His Game, His Rules," *ESPN The Magazine*, March 5, 2013. **"Why did they ask you?":** Julian Bailes interview, 2012. **The daylong meeting:** Unless otherwise noted, this account of the NFL's tumultuous 2007 concussion summit comes primarily from interviews with Mark Lovell, Micky Collins, Julian Bailes, Kevin Guskiewicz, Bob Cantu, and Bill Barr. The timeline is drawn from a written agenda issued by the league to the participants. **"You're looking for an answer":** This quote is from an interview *Times* reporter Alan Schwarz conducted with Pellman and Casson. A recording of the interview was provided by Schwarz. **Goodell also weighed in:** "NFL Personnel Discuss Concussion Management," *St. Petersburg Times* (FL), June 20, 2007. **A bit heated:** Schwarz interview with Pellman.

CHAPTER 12

Omalu wanted to travel to Florida: Details of Florida trip from 2012 interviews with Omalu and Nowinski as well as their respective books. **A two-page document:** Document was provided by Nowinski. **Tossed around names:** Omalu and Nowinski interviews, 2012; Omalu e-mails. **"He can be trusted":** Omalu e-mails. **Omalu brought in his own champion:** The account of how SLI was formed is drawn from interviews with Omalu, Nowinski, Bailes, and Fitzsimmons, and Omalu e-mails. **Resurrected his own concussion summits:** Leigh Steinberg, Nowinski, Omalu, and Bailes interviews, 2012; 2007 National Concussion Summit pamphlet. **"Ticking time bomb":** "Steinberg Labels Concussions 'Time Bomb,'" Associated Press, April 20, 2007. **More disturbing story to tell:** Omalu, Nowinski, Bailes, Lovell, and Guskiewicz interviews, 2012; Omalu PowerPoint presentation. **Sights on the brain of another player:** Bailes and Nowinski interviews, 2012; Omalu e-mails. **Steelers offensive lineman:** Strzelczyk biography from ProFootballReference.com; "What Drove Justin Strzelczyk to His Death?" *Pittsburgh Post-Gazette*, Oct. 21, 2004. **He remembered Strzelczyk:** Bailes interview, 2012. **Schwarz had another**

story: "Lineman, Dead at 36, Exposes Brain Injuries," *New York Times*, June 15, 2007. **The NFL needed a new strategy:** Peter Davies interview, 2012, and e-mails. **Bailes continued to be shaken:** Colleen Bailes and Julian Bailes, interview, 2012. **Casson set out to find an independent expert:** Davies interview, 2012. **A leader in Alzheimer's research:** www.einstein.yu.edu; DeKosky interview, 2012. **Met with the committee at the NFL's headquarters:** Davies interview, 2012. **West Virginia University:** Details of the meeting and the events that followed are from 2012 interviews with Davies, Omalu, Bailes, and Maroon; Omalu and Davies e-mails; the PowerPoint presentation Davies prepared for the NFL; and "Game Brain," *GQ*, Oct. 2009. **"What are you going to do about this?":** This account of Jason Luckasevic's friendship with Omalu and the early conversations about the NFL lawsuit are from 2012 interviews with Luckasevic and Omalu. **On September 18, 2007:** Transcripts from "Oversight of the NFL Retirement System," hearing convened by the Senate Committee on Commerce, Science, & Transportation. **His name was Dave Duerson:** Biography from ProFootballReference.com; Duerson testimony; "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011. **A screaming match:** "Dave Duerson Knew Nothing about Concussions and Players' Best Interests," www.concussioninc.net, Feb. 24, 2011. **Charged with assaulting his wife:** "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011.

CHAPTER 13

Chris Benoit: "The Last Days of Chris Benoit," *Maxim*, Nov. 14, 2007; "Steroids Discovered in Probe of Slayings, Suicide," Associated Press, June 27, 2007. **"I knew him well":** Nowinski e-mail to Omalu and others. **Within days of the murders:** Nowinski interview, 2012, and Omalu e-mails. **ESPN crew showed up:** Arty Berko and Omalu interviews, 2012. **Riddled with CTE:** Omalu, Nowinski, Bailes, Cantu, and Fitzsimmons interviews, 2012. **Raise its national profile:** Omalu and Nowinski interviews; Omalu e-mails; "Why Did Wrestler Kill Wife, Son, Self," *Larry King Live* transcripts, Sept. 6, 2007. **Larry could take only one brain researcher:** Omalu, Nowinski, Bailes, and Fitzsimmons interviews, 2012. **The ESPN piece:** "Brain Chasers," ESPN, *Outside the Lines*, July 28, 2007. **Almost from the beginning:** Omalu and Nowinski interviews, 2012. **SLI began to split apart:** This account of the split is drawn from 2012 interviews with Nowinski, Omalu, Bailes, Cantu, and Fitzsimmons. **"Our Story":** www.sportslegacy.org. **Nowinski had made the connection:** Nowinski and Stern interviews, 2012. **Her name was Ann McKee:** Details of McKee's biography were drawn from interviews with Ann McKee, Chuck McKee, Nowinski, Cantu, and Stern, 2012; "The Woman Who Would Save Football," *Grantland*, Aug. 17, 2012; and www.bu.edu. **Appleton:** "A Place to Place," *Sports Illustrated*, Aug. 11, 1986. **During her Alzheimer's studies:** Ann McKee interview, 2012. **Nowinski got McKee her first brain:** McKee and Nowinski interviews, 2012. **John Grimsley:** Biography derived from ProFootballReference.com; "Former Oiler Grimsley Found Shot to Death," *Houston Chronicle*, Feb. 6, 2008; "Ex-Oilers

Shocked by Loss of Teammate Grimsley," *Houston Chronicle*, Feb. 6, 2008; "Football-Related Head Injuries Affect Players' Loved Ones," *Houston Chronicle*, Oct. 25, 2008. **Two days later, Nowinski called:** Nowinski and McKee interviews, 2012. **She was excited:** McKee interview, 2012. **Her first call:** Ann McKee and Chuck McKee interviews, 2012. **Schwarz broke the story:** "12 Athletes Leaving Brains to Concussion Study," *New York Times*, Sept. 23, 2008. **Omalu was in Lodi:** Omalu interview, 2012. **A Shakespearean drama:** Details surrounding case against Wecht and Omalu's involvement derived from 2012 interviews with both men as well as Shakir and Dominick; "Timeline: The Investigation and Trial of Cyril H. Wecht," *Pittsburgh Post-Gazette*, Jan. 27, 2008. **Brain Injury Research Institute:** Interviews with Omalu, Bailes, Fitzsimmons, and Garrett Webster, 2012. **Another former NFL player died young:** Tom McHale biography from Lisa McHale interview, 2012; ProFootballReference.com; "Ex-Buccaneer Tom McHale Found Dead at 45," *Tampa Bay Times*, Sept. 25, 2008; "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009. **The Omalu Group got to McHale's family first:** Omalu e-mails; Nowinski and Omalu interviews, 2012. **Nowinski called Omalu:** Details of the Omalu Group's agreement with Nowinski and subsequent contact with McHale's family are derived from Omalu's e-mails. **Trying to contact Omalu:** Nowinski interview, 2012. **Go public with the results:** Nowinski and Lisa McHale interviews, 2012. **The press conference:** Details derived from Nowinski, McKee, and Lisa McHale interviews, 2012; "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009; "Sixth NFL Player's Brain Is Found to Have Brain Damage," *New York Times*, Jan. 28, 2009; BU-CSTE press release. **Learned of BU's announcement on TV:** Omalu interview, 2012. **Coming-out party as a spokeswoman:** "Major Breakthrough in Concussion Crisis," *Boston Globe*, Jan. 27, 2009.

CHAPTER 14

It was that kind of call: McKee interview, 2012. **She asked if Nowinski could attend:** McKee and Nowinski interviews, 2012. **Another expert in neurodegenerative disease:** Daniel Perl interview, 2012; www.hjfc3.org/military-medical-symposium/symposium-files/Daniel%20Perl-%20MD.pdf. **McKee was nervous but excited:** McKee interview, 2012. **NFL headquarters:** This account of McKee's presentation to the MTBI committee is drawn from 2012 interviews with McKee, Perl, Nowinski, Henry Feuer, Colonel Michael Jaffee, and John Mann. **Call her brother:** Ann McKee and Chuck McKee interviews, 2012. **The young Pittsburgh lawyer:** Luckasevic interview, 2012. **The league could fall back on:** Collective Bargaining Agreement, specifically the role of the retirement board. **One such case:** "Seeing Is Believing," *Sports Illustrated*, June 9, 2003; "Orlando Brown, Who Sued the N.F.L. over Errant Flag, Dies at 40," *New York Times*, Sept. 23, 2011. **Line up consultants:** Luckasevic interview, 2012; contract with Nowinski. **Questions lingering it could compromise their independence:** Guskiewicz interview, 2012. **A viable case:** Luckasevic interview, 2012. **Goldberg, Persky & White:** www.gpwlaw.com.

Time to fish around: Luckasevic interview, 2012. **Houston-based firm:** "Vioxx Jury Awards \$253 Million in Damages," *Houston Chronicle*, Aug. 20, 2005. **Lanier's lawyers ultimately pulled out:** Luckasevic interview, 2012. **A big win:** "Former Dolphins Receiver O.J. McDuffie Wins \$11.5 Million in Malpractice Lawsuit," *Sun-Sentinel* (Fort Lauderdale), May 5, 2010. **Tierney was right:** Luckasevic interview, 2012. **A big gun in Los Angeles:** Tom Girardi interview, 2012; www.girardikeese.com; "Erin Brockovich: The Real Story," *Salon*, April 14, 2000. **NFL Paper Number 16:** Anders Hamburger et al., "Concussion in Professional Football, Part 16," *Neurosurgery*, June 2009. **Another confounding story:** "Dementia Risk Seen in N.F.L. Players Study," *New York Times*, Sept. 29, 2009. **Announced that it would hold hearings:** "Congress to Hold Hearing on N.F.L. Head Injuries," *New York Times*, Oct. 2, 2009. **Democratic committee staffers:** Details of the setup for the hearing and the NFL's reactions are derived primarily from a 2012 interview with Eric Tamarkin, who at the time was counsel to the committee. **"Will's Bill":** Dick Benson testimony. **"Rebel with a cause":** "N.F.L. Players with Head Injuries Find a Voice," *New York Times*, Oct. 28, 2009. **The packed hearing:** Transcripts from written and oral testimony before the committee. **Linda Sanchez:** Biography from www.lindasanchez.house.gov; and "Sanchez Sisters to Make History in the House," *womensenews.org*, Nov. 19, 2002. **On a shelf in his office at BU:** Nowinski interview, 2012. **400 law firms:** Dan Zegart, *Civil Warriors* (Delacorte Press, 2000), p. 202. **180,000 research papers:** Dan Zegart, *Civil Warriors*, p. 296. **Tobacco fight's version of Omalu:** Dan Zegart, *Civil Warriors*, p. 37. **Started in the morgue:** Ernst Wynder biography: cdc.gov/mmwr/preview/mmwrhtml/mm4843bx.htm. **Among the 62 mice still alive:** Ernst Wynder et al., "Experimental Production of Carcinoma with Cigarette Tar," *Cancer Research*, 1953. **Research group:** Dan Zegart, *Civil Warriors*, p. 37. **"Savage the other side":** Dan Zegart, *Civil Warriors*, p. 38. **"A front":** Victor DeNoble interview, 2012. **A "metaphysical quarrel":** Dan Zegart, *Civil Warriors*, p. 38. **"NFL equals Tobacco":** Stern interview, 2012. **"Graciously" resigned:** "Co-Chairmen of NFL Concussion Panel Resign," Associated Press, Nov. 25, 2009. **Several changes to its concussion policy:** "NFL Changes Return to Play Rules for Concussions," Associated Press, Dec. 3, 2009; "New N.F.L. Rule on Concussions Benches Injured," *New York Times*, Dec. 3, 2009. **The headline that the NFL never wanted to see:** "Is Tackle Football Too Dangerous for Kids to Play?" *New York Times* blog, Nov. 30, 2009. **A guest column:** "Listening to Wisdom from a 10-Year-Old Son about His Head Injury," *New York Times*, Nov. 28, 2009. **A wire report:** "NFL to Ask Its Players to Donate Brains for Study," Associated Press, Dec. 20, 2009. **Schwarz was surprised:** Details of Schwarz's reaction and his call to Aiello derived from 2012 interview with Schwarz. **Nowinski on the phone:** Schwarz and Nowinski interviews, 2012. **The timing of the NFL's announcement:** Nowinski interview, 2012. **The following headline:** "N.F.L. Acknowledges Long-Term Concussion Effects," *New York Times*, Dec. 21, 2009. **Sent a bottle of champagne to BU:** Nowinski interview, 2012.

CHAPTER 15

"Started from zero": Dr. Mitchel Berger interview, 2012. **Head, Neck and Spine Committee:** "NFL Picks Two New Co-Chairs of Concussion Committee," Associated Press, March 18, 2010. **A two-page letter:** The framed letter is posted on the wall at the offices of the BU Center for the Study of Traumatic Encephalopathy, 2012. **A full-fledged member:** Guskiewicz interview, 2012. **Appointing brain surgeons:** "NFL Picks Two New Co-Chairs of Concussion Committee," Associated Press, March 18, 2010. **Ellenbogen:** Dr. Rich Ellenbogen interview, 2012; "Taking Brain Injuries out of Sports," *Seattle Magazine*, Fall/Winter 2012. **Batjer:** Dr. Hunt Batjer interview, 2012. **Batjer and Ellenbogen professed to know very little:** Batjer and Ellenbogen interviews, 2012. **At odds with Ellenbogen's review:** Anders Hamburger et al., "Concussions in Professional Football, Part 16," *Neurosurgery*, Aug. 2007 (comments). **"Like the same old NFL":** "House Panel Criticizes New N.F.L. Doctors," *New York Times*, May 24, 2010; "Panel Criticizes NFL on Safety Research," Associated Press, May 24, 2010. **A man in exile:** Omalu interview, 2012. **BU's researchers literally kept a file:** Stern interview, 2012. **Omalu's exag-gerations:** Cantu interview, 2012. **Nowinski was no more charitable:** Transcripts, *Dennis & Callahan Radio Show*, Oct. 14, 2010. **A writer for GQ:** Jeanne Marie Laskas interview, 2012. **Never recognizing the need to filter:** Lovell and Guskiewicz interviews, 2012. **Ban on tackle football:** Cantu interview, 2012; "Preventing Sports Concussions Among Children," *New York Times*, Oct. 7, 2012. **"He got steamrolled":** Collins interview, 2012. **The league's biggest threat:** Bailes interview, 2012. **Omalu's marginalization:** Carson interview, 2012. **On February 17, 2011:** Details of Duerson's death and the scene at the condo from Sunny Isles Beach Police Department Incident/Investigation Report, Feb. 17, 2011; Tregg and Alicia Duerson interviews, 2012; excerpts of texts to Alicia Duerson; excerpts of letter left by Duerson. **Cast a proxy vote:** Mike Webster disability lawsuit court records. **Copy of Sports Illustrated:** "Concussions: The Hits That Are Changing Football," *Sports Illustrated*, Nov. 1, 2010. **A DVD case:** "Trapped: Haitian Nights," *The Movie Database*. **"Football's First Martyr":** "Dave Duerson: Football's First Martyr Can't Die in Vain," *Time*, Feb. 25, 2011. **A star scholar-athlete:** Duerson biography, both rise and fall, derived from Alicia Duerson, Tregg Duerson, and Harold Rice interviews, 2012; "You Have to Accept My Pain: An Interview with Dave Duerson Three Months before His Suicide," *Deadspin*, Feb. 23, 2011; "Dave Duerson: The Ferocious Life and Tragic Death of a Super Bowl Star," *Men's Journal*, May 2011; ProFootballReference.com; bankruptcy records. **Duerson had a radio show:** *Double Time with Double D* radio show, VoiceAmerica, Oct. 21, 2010. **Donating his father's brain:** Details of Duerson family efforts to donate his brain are from 2012 interviews with Tregg Duerson, Alicia Duerson, Kelly Woods, and David Krichavsky. **NFL wasn't nearly as unified:** Berger, Ellenbogen, Batjer, and Guskiewicz interviews, 2012. **BU's rock star:** "The Woman Who Would Save Football," *Grantland*, Aug. 17, 2012. **Conference in Las Vegas:** "Chronic Traumatic Encephalopathy," conference in Las Vegas, Sept. 30–Oct. 1, 2012. **Their most ominous**

assertions: McKee, Cantu, Stern, and Nowinski interviews, 2012. **If CTE was occurring at a deep level:** McKee interview, 2012; Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **One of BU's main critics:** Berger interview, 2012; http://neurosurgery.ucsf.edu/index.php/about_us_faculty_berger.html. **Wasn't a single recorded case:** Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **Self-selecting quality:** McKee, Cantu, Berger, and Ellenbogen interviews, 2012. **"With all due respect":** Cantu interview, 2012. **"The facts are the facts":** Nowinski interview, 2012. **Steer Duerson's brain:** Batjer interview, 2012. **From the new committee's inception:** Ellenbogen, Guskiewicz, and Berger interviews, 2012. **A press conference:** "Duerson's Brain Trauma Diagnosed," *New York Times*, May 2, 2011. **"Drove him to suicide":** McKee interview, 2012. **"I just can't even believe this":** McKee interview, 2012.

CHAPTER 16

Two dozen clients: Ron Feenberg interview, 2011. **A new front:** "Former Pro Athletes Battle against Bill Limiting Workers' Comp," *Sacramento Bee*, April 16, 2013. **A fierce lobbying campaign:** The NFL, with support from the other major sports leagues and 16 California teams, rallied around AB 1309, a bill that would close the loophole. On April 24, 2013, the bill passed out of the California State Assembly's Insurance Committee by a unanimous 11-0 vote and was headed to the full assembly for debate. **Brady and ... Brees:** "Injured Pro Athletes Deserve Workers' Comp," *San Francisco Chronicle*, June 24, 2013. **Luckasevic had found:** Jason Luckasevic interview, 2012. **One of the first ... cases:** Jeanne Marie Laskas, "The People V. Football," *GQ*, March 2011. **On July 19, 2011:** See *Vernon Maxwell, et al. v. National Football League, et al.*, Superior Court of the State of California, July 19, 2011. **"We thought maybe":** Tom Girardi interview, 2012. **The next month:** *Charles Ray Easterling and his wife, Mary Ann Easterling; et al. v. National Football League, Inc.*, U.S. District Court for the Eastern District of Pennsylvania, Aug. 17, 2011. Later, the Easterling suit would be described in some accounts as the first brain injury case to be filed against the NFL. It was the first to be filed in federal court, where all the cases were later consolidated. **"I won't remember":** "Taking Its Toll," *Outside the Lines*, March 16, 2012. **Painfully familiar:** "Death Isn't the End," *New York Times*, May 4, 2012. **Riddled with CTE:** "Football Player Who Killed Himself Had Brain Disease," *New York Times*, July 27, 2012. **By the time the results were released:** Nathan Fenno and Luke Rosiak of the *Washington Times* compiled the most comprehensive database on the lawsuits, a working online document that allows users to explore the plaintiffs by team, position, and number of seasons played. The database can be found at: washingtontimes.com/footballinjuries/; the website NFLConcussionLitigation.com has maintained the most current information about the lawsuits and the plaintiffs. **50 military service members:** G. Wolf et al., "The Effect of Hyperbaric Oxygen on Symptoms after Mild Traumatic Brain Injury," *Journal of Neurotrauma*, 2012. **Medieval-sounding device:** Julian Bailes interview, 2012.

Pilot study: Gary W. Small et al., "PET Scanning of Brain Tau in Retired National Football League Players: Preliminary Findings," *American Journal of Geriatric Psychiatry*, 2013. **Nearly every NFL team:** The ImPACT website lists many of the company's clients. See ImpactTest.com. **Two heart attacks:** Mark Lovell interview, 2012. **His own research:** Maroon coauthored a study on the use of natural plant extracts to neutralize the chemical reaction that leads to brain disease. See Russell L. Blaylock and Joseph Maroon, "Natural Plant Products and Extracts That Reduce Immunoexcitotoxicity-Associated Neurodegeneration and Promote Repair within the Central Nervous System," *Surgical Neurology International*, 2012. **A letter to the FTC:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **One mouth guard:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **An endorsement:** Letter from Tom Udall to Federal Trade Commission Chairman Jon Leibowitz, Jan. 4, 2011. **"No significant data":** Testimony of Jeffrey S. Kutcher, Senate Commerce Committee, Oct. 19, 2011. **"Don't forget to take your fish oil!":** Peter Davies e-mail correspondence. **FTC ordered:** Letter from Mary K. Engle, the FTC's associate director for advertising practices, to John M. Shanahan, CEO, Newport Nutritionals, Inc., Nov. 7, 2012. **Closed its investigation:** Letter from Engle to John E. Villafranco, representing Riddell Sports Group, Inc., April 24, 2013. **A coffee table book:** *The First 50 Years*. **Their own words:** *The First 50 Years*, pp. 39-83. **"Propaganda organ":** "Steve Sabol, Cinematic Force for N.F.L., Dies at 69," *New York Times*, Sept. 18, 2012. **Origin story:** Michael Oriard, *Brand NFL*, pp. 14-18. **"NFL football is real":** Oriard, *Brand NFL*, p. 14. **Swallowed his tongue:** Andy Russell, *A Steeler Odyssey*, p. 15. **Summer of 2012:** E-mail from Clare Graff, NFL Communications, to Lorraine Esposito. **"He really wanted to know":** Lorraine Esposito interview, 2013. **Dumb Mom:** Amanda Rodriguez interview, 2013. **Two helmets crashing:** "N.F.L.'s Policy on Helmet-to-Helmet Hits Makes Highlights Distasteful," *New York Times*, Oct. 21, 2010. **Pull a commercial:** "Unhappy NFL Prods Toyota to Edit TV Ad," Reuters, Jan. 19, 2011. **Pointed out:** On Feb. 4, 2013, Crossman tweeted: "So far I have found three players in the NFL's safety evolution commercial from last night who are suing the league over concussions."

CHAPTER 17

Hunched over a microscope: Bennet Omalu interview, 2012. **Raised in a violent ghetto:** Award-winning sportswriter Jill Lieber Steeg wrote one of the first lengthy profiles on Seau's unlikely rise to NFL stardom for *Sports Illustrated* in 1993. After Seau's suicide, she produced an exhaustive two-part series on the events leading up to his death. See Jill Lieber, "Hard Charger," *Sports Illustrated*, Sept. 6, 1993, and "Junior Seau: Song of Sorrow," *San Diego Union-Tribune*, Oct. 14, 2012. **12 yards deep:** Gary Plummer interview, 2013. **Seau was loud:** The account of Seau's personality changes and the final years of his life is drawn primarily from interviews with members of Seau's family, including three of his four children and Gina Seau, his ex-wife; Bette Hoffman, former director of the Junior Seau Foundation and the

executor of his will; and Lieber's *Union-Tribune* articles. **When police arrived:** Junior Seau autopsy report, Aug. 20, 2012. **Placed on a gurney:** The account of the events in Seau's house after his death and Tyler Seau's phone call with Bennet Omalu and Julian Bailes is from interviews with Tyler Seau, Bette Hoffman, Joe Davis, Bennet Omalu, and Julian Bailes. **At 8:38 that night:** E-mail correspondence between Tyler Seau and Bennet Omalu. **Chargers' doctor:** E-mail correspondence between Tyler Seau and Bennet Omalu. **Chao had his own issues:** The Medical Board of California website contains detailed records of the allegations against Chao and issues surrounding his drinking. See: mbc.ca.gov. For additional details of Chao's checkered history, see "The Chargers' Doctor Is a Drunk Quack. Why Haven't They Fired Him?" *Deadspin*, April 24, 2013. On June 13, 2013, Chao stepped down after 17 years as the Chargers' doctor. "I talked to the Chargers about my back problems in March and my desire to spend more time with my newborn twins and young daughter," Chao said in a statement released by the team. **At least a half dozen:** Craig Nelson interview, 2013. **Prusiner placed calls:** Prusiner's interest in obtaining part of Seau's brain is confirmed in e-mails and interviews with Bennet Omalu and Joe Davis. **"I empathize":** Peter King interview, 2013. **Nelson told Omalu:** Nelson interview, 2013. **Soot and the imprint:** Seau autopsy report, Aug. 20, 2012. **"Persona non grata":** Bennet Omalu interview, 2012. **Celebratory e-mail:** E-mail correspondence between Bennet Omalu and Stanley Prusiner. **Nowinski emphasized:** Tyler Seau interview, 2013. **At the center of the league's effort:** The account of the NFL's effort to take control of Seau's brain is drawn from interviews with Tyler Seau, Bette Hoffman, Gina Seau, Kevin Guskiewicz, Rich Ellenbogen, Russell Lonser, and others familiar with the negotiations. **"An early draft":** Bob Fitzsimmons interview, 2013. **Got a call:** Gary Plummer interview, 2013. **That was certain:** "Doctors: Junior Seau's Brain Had CTE," ESPN.com, Jan. 11, 2013. **"I still love football":** Jake Seau interview, 2013.

EPILOGUE

A proposal: The section on Gary Huber's dealings with Big Tobacco is drawn from Dan Zegart, *Civil Warriors*, 2000; and Robert N. Proctor, *Golden Holocaust*, 2011. **50 confirmed cases:** Ann C. McKee et al., "The Spectrum of Disease in Chronic Traumatic Encephalopathy," *Brain*, 2012. **43 percent:** Associated Press, Aug. 7, 2012. **"No genius":** Matt Chaney e-mail to authors, 2013. **Dispensed paid advice:** "Researchers consulted with law firms," ESPN.com, April 6, 2013. **Had given way:** "Concussion Kickoff: Oral Arguments Held in NFL Concussion Litigation," NFLconcussionlitigation.com, April 10, 2013. **"Guiding strategists":** *United States of America v. Philip Morris USA Inc.*, District Court for the District of Columbia Judge Gladys Kessler, Aug. 17, 2006, p. 97. **Directed litigation:** Ibid., p. 68. **"Whitecoats":** Robert Proctor, *Golden Holocaust*, p. 545, and "Proposal for the Organization of the Whitecoat Project," Bates 3990006961/3990006964, at the University of California, San Francisco Legacy Tobacco Documents Library. See <http://legacy.library.ucsf.edu/tid/ecr82i00/pdf>. **"Deep shit":** Robert

Proctor, *Golden Holocaust*, p. 303, and "Project Down Under: Conference Notes," June 24, 1987, Bates 2021502102-2134 (p. 4). See <http://legacy.library.ucsf.edu/tid/njh56b00/pdf>. **When he first arrived:** Jim Otto interview, 2012. **Descendant of the Roman gladiators:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 7. **A gash:** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. viii. **"Looking at a gargoyles":** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 143. **"Middle-aged horror show":** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 2. **Probably end up killing him:** Otto interview, 2012. **"I'm not a wimp-out":** Jim Otto with Dave Newhouse, *Jim Otto: The Pain of Glory*, p. 6.

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INDEX

- Aiello, Greg, 74, 215, 277, 284-85
 Aikman, Troy, 71, 76-78, 79, 82, 117, 125, 167, 283
 Ali, Muhammad, 71, 216
 Allegheny General Hospital, 31, 35, 37, 44, 63, 67
 Alzheimer's disease, 158, 192, 235, 255, 259, 267, 268, 277, 312
 see also dementia
 Amen Clinics, 310, 351
 American Academy of Neurology, 32, 68-69
 American Association of Neurological Surgeons, 205, 234
 American College of Sports Medicine, 141
 American Orthopaedic Society for Sports Medicine, 136
 Anapol Schwartz PC, 309
 Anderson, Dave, 73
 Appleton, Wisc., 255-56
 Apuzzo, Michael L. J., 139-40, 172
 at Concussion Summit, 219-21, 226-27
 as *Neurosurgery* editor, 139, 140, 141-43, 146, 172-73, 180-82, 188, 189, 197, 226, 291
 as NY Giants consultant, 139-40, 220, 227
 Arfken, Cynthia, 210-11
 Atlanta Falcons, 177
 Atwater, Steve, 40

 Bailes, Colleen, 235
 Bailes, Julian, 67-68, 81, 82, 116, 117, 119, 126, 144, 150, 174, 203, 207, 233-34, 261, 262-63, 266, 277, 293, 336, 344
 concussion prevention devices developed by, 311-12
 at Concussion Summit, 1-2, 219, 220, 224-25, 272
 Guskiewicz and, 113, 114-15
 long-term brain damage studied by, 67-69, 113, 114, 146, 198, 202
 MTBI papers reviewed by, 146, 175
 Omalu and, 197-98, 205, 234-35
 and Seau's brain autopsy, 324-25, 330
 SLI and, 232, 234, 252-54
 Barr, Bill, 128, 140, 175, 207, 312
 Collins's confrontation with, 223-24
 at Concussion Summit, 219, 220, 221
 Lovell attacked by, 221-22, 223
 MTBI papers criticized by, 176-78, 221
 Pellman and, 175-76, 178, 179-80
 Barr, John, 129
 Barth, Jeff, 33-35, 37, 38, 66, 67, 114, 126, 128, 159
 Bartkowski, Steve, 75-76
 baseball, 5, 127, 239
 Batjer, Hunt, 288-90, 304
 Baxter, Fred, 177
 Belichick, Bill, 14, 214, 259
 Bell, Todd, 299-300
 Benoit, Chris, 249, 250
 Benson, Dick, 278
 Benson, Will, 278
 Berbick, Trevor, 216
 Berg, Peter, 323
 Berger, Mitch, 286, 302-4

Berko, Arty, 250
 Berlin, Ralph, 21, 113–14
 Bert Bell/Pete Rozelle NFL Player Retirement Plan, 86–87, 91, 272–73, 294
 benefits for long-term brain damage granted by, 168–70
 Webster lawsuit against, 101, 105, 168–70, 192
 and Webster's disability claim, 98–101, 168
 beta-amyloid plaques, 158, 259, 268
 Bettman, Gary, 74
 Biokinetics, 143, 184
Biologic Effects of Tobacco, The (Wynder), 280
 Blackledge, Ron, 27
 Bleier, Rocky, 22, 25, 40, 96
 Blount, Mel, 96, 104
 Bonds, Barry, 127
 Boston City Hospital, 341
Boston Globe, 213
 Boston University School of Medicine, 253, 254, 255, 257, 264
 see also BU Group
 boxers, 216
 Parkinson's disease in, 159
 Punch-Drunk Syndrome in, 89, 90, 97, 110, 158–59, 161, 190, 191, 192, 197, 257, 259, 268, 302
 Boyd, Brent, 87, 243–45, 280
 Bradshaw, Terry, 3, 4, 23, 25, 67, 104, 347
 at Webster's Hall of Fame induction, 58–60, 62
 Brady, Kyle, 129, 130, 177
 Brady, Tom, 307
 brain, anatomy of, 32–33
 brain damage, long-term, 6, 117–18
 Bailes's and Jordan's research on, 67–69, 113, 114, 146
 Casson's denial of, 215–18, 219, 225
 MTBI Committee's denial of, 145–47, 167–68, 170, 174–75, 198, 210, 234, 239, 269–71
 NFL's acknowledgment of, 284–85, 290
 NFL's ignoring of evidence on, 2, 280
 Webster as advocate for issue of, 94–95
 see also chronic traumatic encephalopathy (CTE); concussions, sports-related
 Brain Injury Association of America, 102
 Brain Injury Research Institute, 261–62
 see also Omalu Group
 Brain-Pad, 315–16, 317
Brain Surgery (Apuzzo), 139
 Brees, Drew, 307
 Brister, Bubby, 31, 35, 40, 347–48
 Brooks, Michael, 70
Brown, et al. v. N.F.L., 273
 Brown, Hardy, 135, 364*n*
 Brown, Jerome, 40
 Brown, Orlando, 273
 Bryant, Waymond, 20
 BU Group, 253–54, 330, 343
 brain bank of, 259, 284, 287, 301, 303, 304, 305
 competition between Omalu group and, 261–62, 290–91
 NFL concussion committee's disparagement of, 301, 302–3, 304
 NFL's donation to, 283–84, 287, 301 and Seau's brain autopsy, 332–33, 335–36
 Super Bowl press conference of, 263–65
 Butkus, Dick, 5
 Caddick, Christine, 73
 Caito, Fred, 42
 California, workers' compensation cases in, 306, 307

California Superior Court, 309
 Campbell, Earl, 168
 Cantu, Bob, 136–37, 140–41, 174, 198, 203, 207, 217, 250–51, 291, 292, 302, 303–4, 347
 concussion guidelines of, 141–42
 at Concussion Summit, 219, 221, 222
 helmet study paper attacked by, 186–87
 Johnson's incipient dementia diagnosis by, 214
 as *Neurosurgery* sports section editor, 140, 142, 143, 146–47, 171–74, 175, 180, 186–87
 NFL donation and, 284, 287
 Nowinski and, 200–201, 254
 on SLI board, 232, 252
Captain for Life (Carson), 208
 Carson, Harry, 25, 63–64, 73, 209–10, 347
 on backlash against Omalu, 293
 and Webster's death, 207–9
 Casson, Ira, 126, 128, 171, 210, 234, 270–71, 277, 278, 279
 boxing brain damage study of, 70–71, 216
 brain damage evidence denied by, 215–18, 219, 225
 at Concussion Summit, 2, 221, 224
 Goldberg's interview of, 217–18
 Guskiewicz's research attacked by, 217
 McKee's findings attacked by, 268–69, 270
 as MTBI Committee cochair, 215, 235–36, 237, 238, 239, 266, 286
 Omalu's research attacked by, 189–92, 215, 335
 resignation of, 283, 286
 CBS, 75, 322–23
 Center for the Study of Retired Athletes, 226, 336, 344, 346
 Center for the Study of Traumatic Encephalopathy, *see* BU Group
 Chaney, Matt, 344
 Chao, David, 331, 334, 335–36
 Chicago Bears, 20, 41–43, 118–22, 132, 177, 178, 296, 309–10
 Chrebet, Wayne, 130
 chronic traumatic encephalopathy (CTE), 7–8, 163, 190–91, 194–96, 197, 205, 257, 259, 261–64, 266, 272, 300, 311, 312
 Bailes's Concussion Summit presentation on, 224–25
 SLI Super Bowl press conference on, 263–65
 steroid use and, 238–39
 subconcussive blows as possible cause of, 302
 tau protein buildup in, 224, 225, 236, 267, 268
 see also brain damage, long-term; concussions, sports-related
 "Chronic Traumatic Encephalopathy in a National Football League Player" (Omalu et al.), 163–65, 188–92, 202, 215, 257
 Chrostowski, Leszek, 201–2
Civil Warriors (Zegart), 281, 341, 342
 Cleveland Browns, 168, 177
 Cobb, Randall "Tex," 216
 Coben, Larry, 309–10
 Cohen, Will, 283
 Colangelo, Ron, 128
 Cole, Robin, 16
 collective bargaining agreement (CBA), 272–73
 Collins, Michael "Micky," 64–65, 69, 159, 175, 183, 215, 226, 292–93, 313
 Barr confronted by, 223–24
 brain research of, 65–66, 137
 helmet study of, 184–87, 211, 315, 369*n*–370*n*
 ImPACT and, 113, 183
 Lovell as mentor to, 66–67
 Colucci, Anthony, 281

- concussion, definitions of, 32, 115, 132
 concussions, sports-related:
 Barth's research on, 33–35, 37, 38
 depression and, 116, 117
 early dementia and, 116, 144, 145
 fans' growing awareness of, 69–70, 71–72, 125
 guidelines for, 31–32, 35–36, 37–38, 141–43
 Guskiewicz's research on, 114–18
 lack of research on, 32, 78
 Lovell and Maroon's test for, *see* ImPACT; Pittsburgh Steelers Test Battery
 medical entrepreneurs and, 310–14
 NFL's downplaying of, 74–75, 82, 144–45
 1996 conference on, 63–65
 physics of, 138
 seriousness of, as underplayed, 32–33
 Steinberg and, 77–79, 80–82, 110, 125
 see also brain damage, long-term; chronic traumatic encephalopathy (CTE)
 Concussion Summit, 1–2, 218–28, 229, 234, 254, 266, 272
 Congress, U.S., 7, 87, 216, 242
 see also House of Representatives, U.S.; Senate Commerce Committee
 Congress of Neurological Surgeons, 139
 Conyers, John, 278–79
 Corcoran, John, 199
 Corsellis, J. A. N. "Nick," 159, 192
 Council for Tobacco Research, 281
 Courson, Steve, 22, 23, 85
 Crabb, Barbara B., 369*n*–370*n*
 Creutzfeldt-Jakob disease, 332
 Crossman, Matt, 323
 Crowe, Cameron, 76
 Culp, Curley, 25
 Culverhouse, Gay, 278
 Curinga, Lou, 21
 D'Alessandro, David, 262
 D'Amico, Carmen, 149, 156–57
 Davies, Peter, 235–39, 259, 267, 269, 317
 Davis, Joe, 333, 334
 Deese, Derrick, 108
 Defense and Veterans Brain Injury Center, 268
 DeKosky, Steve, 161–64, 189, 191–92, 196–98, 205, 209–10, 257, 259
 Delsohn, Steve, 251, 310
 dementia, 116, 144, 145, 198, 214–15, 232, 233, 243, 308
 see also Alzheimer's disease; brain damage, long-term; chronic traumatic encephalopathy (CTE); Punch-Drunk Syndrome
 DeNoble, Victor, 281
 Denver Broncos, 70, 110
 Dissenters, 174, 180, 181, 187, 198, 203, 207, 218, 219, 254, 287, 335, 343
 Dominick, Joe, 148–49, 155
 Dotsch, Rollic, 14
 Duerson, Alicia, 294, 296–99, 300, 304
 Duerson, Dave:
 Alicia assaulted by, 298
 background of, 295–96
 business career of, 297–99
 concussions of, 294–95, 296
 CTE diagnosed in, 7, 304–5
 as desiring to donate brain to research, 295, 300, 304
 mental problems of, 297–98
 NFL concussion policy defended by, 244–45, 294
 on NFL disability board, 294, 299
 as player representative, 244, 296–97
 suicide of, 7, 293–95, 300, 305

- Duerson, Tregg, 294, 299, 300–301, 304
 Duper, Mark, 308
 Easterling, Ray, 310
 Ellenbogen, Richard, 288–90, 304, 314
 Elway, John, 110
 ESPN, 70, 109, 118, 204, 207, 249–50, 311, 322, 347
 authors' investigation supported by, 4, 8–9
 market research of, 4–5
 NFL contract of, 4, 8, 73
 SLI story of, 249–50, 251
 Webster story of, 57
 Esposito, Lorraine, 321
 Facenda, John, 319–20
False Glory: Steelers and Steroids (Courson), 22
 Federal Trade Commission (FTC), 6, 315, 317–18
 Feenberg, Ron, 306–7
 Feuer, Hank, 126, 133, 170–71, 210–11, 269, 277, 288
 Finder, Chuck, 194
First Fifty Years, The (NFL), 318–19
 Fitzsimmons, Bob, 261, 262, 337
 in NFL lawsuit, 101, 105, 168–70
 Omalu's call to, 105
 SLI and, 232, 252–54
 Webster's disability case and, 87–92, 98–101
 Webster's friendship with, 89, 92, 94, 96, 105
 Fogel, Robert, 119, 120, 121, 122
 football:
 brain damage caused by, *see* brain damage, long-term; chronic traumatic encephalopathy (CTE); concussions, sports-related
 Hoge's defense of, 347
 inherent brutality in, 5–6, 39, 134
 U.S. obsession with, 5, 345–46
 football, high school and college, concussions in, 97, 114, 141, 181, 183, 185–86, 210, 211, 264, 278
 football, Pee Wee and middle school, concussions in, 211, 283, 288
Football Physics (Gay), 72
 football players, retired, 198
 brains of, as scientific commodities, 7, 8
 dementia in, 144, 145, 243, 308
 Guskiewicz's surveys and, 115–17
 health insurance problems of, 68
 in negligence lawsuits, 7, 241–42, 272–76, 307, 308–9, 347–49
 neurological problems of, 68–69
 suicides by, 7, 193–94, 201, 204, 249, 293–95, 310, 324–25, 329–30
 see also individual players
 forensic pathology, 154–55, 160
 Fox Network, 75
 Framingham Heart Study, 255, 259
 Frenk, Julio, 349
Frontline, 184, 341
 Garber, Greg, 70, 73, 109, 204
 Garcia, Jeff, 110
 Gaunt, Sarah E., 99–100
 Gay, Tim, 5, 72–73
 Giordani, Bruno, 34
 Girardi, Tom, 276, 309
 Goldberg, Bernard, 217–18
 Goldberg, Persky & White, 272, 274–75
Golden Holocaust (Proctor), 341
 Goodell, Charles, 219
 Goodell, Roger, 220, 221, 228, 240, 322, 344, 349
 Casson and Viano resignation to, 283, 286
 Concussion Summit and, 1, 218–19, 272
 Judiciary hearing testimony of, 278–80
 Gordon, Joe, 55, 61, 91, 104
 Graff, Clare, 321

Gray, Mel, 323
 Green, Darrell, 324
 Green Bay Packers, 7, 255, 257
 Greene, Joe, 14–15
 Grimsley, John, 258–59, 285
 Grimsley, Virginia, 258, 285
 Grossman, Randy, 96
 Grunhard, Tim, 28–29, 51
 Guskiewicz, Kevin, 137, 159, 174, 175, 203–4, 207, 227–28, 274, 313, 336
 on backlash against Omalu, 292
 Bailes and, 113, 114–15
 brain damage research of, 114–18, 130–31, 145, 146, 198, 202
 causal relationship between
 concussions and CTE questioned
 by, 343–44, 346
 at Concussion Summit, 218, 219, 220, 226, 272
 health surveys of, 115–17
 MacArthur “genius grant” of, 113, 287, 344
 MTBI papers reviewed by, 146–47, 171–72, 175, 180–81
 NFL attack on research of, 170–71, 217, 366*n*–367*n*
 on NFL concussion committee, 287–88, 336, 343–47

 Halas, George, 135
 Halberstam, David, 74–75, 87
 Haley, Dick, 20–21
 Hallenbeck, Scott, 321
 Hall of Fame Players Association, 162
 Ham, Jack, 15
 Hamilton, Ronald, 159–62, 163, 164, 189, 191–92, 194, 196–98, 205, 234, 259
 Hampton, Rodney, 308
 Hardy, David, 342
 Harris, Franco, 104
 Harrison, James, 350
 Harvard Brain Tissue Resource Center, 231
 Harvard Project, 341–43
 Harvard School of Public Health, 349
 Haynes, Mike, 58
 HBO, 266, 279
Head Games: Football’s Concussion Crisis (Nowinski), 201, 232, 280
 helmet design, 6, 134–36, 315, 317, 369*n*–370*n*
 MTBI Committee and, 134, 136–38, 142–43, 184–87, 211–12
 NOCSAE standards for, 143–44
 see also Riddell
 Hester, Devin, 323
 Hicks, Paul, 323
 Himmelhoch, Jonathon, 90, 96, 97
 Hoffman, Bette, 326, 327, 328, 330
 Hoge, Merril, 27–28, 39–41, 63, 73, 97, 117, 171, 178, 312
 concussions of, 40–45, 64–65, 71, 118–22
 concussion test and, 39, 44, 65
 football defended by, 347
 Munsell sued by, 118–22, 125, 128–29, 132–34
 retirement of, 45, 63, 79, 109, 125, 189
 House of Representatives, U.S.:
 Committee on Government Reform
 of, 127
 Judiciary Committee football
 hearings of, 277–83, 287, 289–90
 Hovda, David, 141
 Huber, Gary, 341–43
 Huff, Sam, 244–45

 Ide, Thad, 185
 Ilkin, Tunch, 23, 27, 40
 ImPACT (Immediate Post-Concussion
 Assessment and Cognitive
 Testing), 38–39, 44, 67–68, 97, 112–13, 174, 182–83, 194, 215, 223, 317, 348
 financial success of, 312–13, 314
 helmet study and, 185, 369*n*–370*n*

Jaffee, Col. Michael, 268–69, 270
 Jani, Sunny, 51–54, 57–58, 85, 88, 94, 95, 103–4
Jerry Maguire (film), 76, 79
 Johnson, Billy “White Shoes,” 168
 Johnson, Keyshawn, 177
 Johnson, Ted, 213–14, 218, 259–60, 263
 Jolly, Tom, 203
 Jones, Barbara, 232
 Jordan, Barry, 68–69, 82, 126, 144, 146
Journal of Forensic Nursing, The, 291
Journal of Neurology, Neurosurgery, and Psychiatry, 216
Journal of the American Medical Association (JAMA), 65–66, 69, 164, 175
 Joyner, Seth, 40
 Junior Seau Foundation, 326, 328

 Kansas City Chiefs, 28–29, 50–51
 Keating, Peter, 128, 176, 204, 207
 Kelly, Charles, 89–90, 94–95, 96, 97, 103
 Kelso, Mark, 63
 Kent State University, 14, 15
 Kentucky, University of, 342
 Kim, Duk Koo, 216
 Kinetic energy, 72–73
 King, Peter, 332–33
 Klint, Jim, 109
 Kolb, Jon, 14, 16, 21, 23, 26
 Krieg, Fred, 89, 96, 97
 Kutcher, Jeffrey, 316

 Lambert, Jack, 2, 14, 15–16, 20, 67
 Lane, Dick “Night Train,” 136
Larry King Live, 250–51
 Laskas, Jeanne Marie, 291
 Lavin, Shelly, 297
 Lawrence University, 256, 259
 Lewis, Ray, 323
 Lewy bodies, 159–60

 Livingston, Bill, 73
 Lloyd, Greg, 64
 Lombardi, Vince, 13, 138
 Long, Terry, 193–96, 233
Longevity Factor, The (Maroon), 36, 317
 Long Island Jewish Medical Center, 128, 235
 Lonser, Russ, 336, 338
 Lorenz, Konrad, 319
 Lovell, Mark, 35, 36, 37–38, 64, 65, 80, 82, 200, 215, 217, 221–22, 292, 313
 Barr’s attack on, 221–22, 223
 brain damage research of, 126, 128, 137, 178, 182
 Collins mentored by, 66–67
 in helmet study, 185, 211, 315, 369*n*
 in Hoge lawsuit, 119, 125, 132, 178
 ImPACT and, 38–39, 44, 67–68, 97, 112–13, 174, 182–83, 312–13
 on MTBI committee, 125–26, 131, 137, 174–75, 178–79, 185, 313
 MTBI papers coauthored by, 175, 178–79, 182
 as NFL Neuropsychology Program
 head, 132, 174–75, 176–77, 183
 Luckasevic, Jason:
 NFL lawsuit of, 241–42, 272–76, 307, 308–9, 347
 Omalu’s friendship with, 240–42, 272, 308–9
 Lynch, Ben, 80

 MacArthur Foundation, 113, 287, 344
 McCoy, Colt, 350
 McDuffie, O. J., 275
 McHale, Lisa, 261, 262, 263, 264
 McHale, Tom, 261–65
 McKee, Ann, 7–8, 257, 284, 301–2, 303, 304, 305, 323, 336, 346
 background of, 255–57
 at BU Group Super Bowl press
 conference, 264–65

McKee, Ann (*continued*):
 Grimsley's brain autopsied by, 258–59
 Judiciary Committee testimony of, 282–83
 McHale's brain autopsied by, 263
 MTBI presentation of, 266–71
 on subconcussive blows as cause of CTE, 302
 McKee, Chuck, 256, 259, 271
 Mackey, John, 214–15, 218
 Mackey, Sylvia, 215
 McLuhan, Marshall, 318
 McMahon, Jim, 106, 309–10
 MacMullan, Jackie, 213
 McNeill, Fred, 307, 310, 312
 McNeill, Gavin, 308
 McShane, John, 133–34
 Makris, Billy, 18–19
 Malanga, Gerard, 211
 Mancini, Ray, 216
 Mann, John, 267, 269, 270–71
 Mansfield, Ray, 21
 Mara, Wellington, 58
 Marion, Donald, 189
 Mariucci, Steve, 108, 109
 Marks, Stanley, 55
 Maroon, Charles, 36
 Maroon, Joe, 31–32, 35, 63, 64, 66–67, 74, 114, 126, 171, 178, 180, 205, 224, 235, 316
 concussion testing and, 37–39
 entrepreneurship of, 35–37
 helmet study and, 315, 317
 Hoge and, 43–46, 119
 IMPACT and, 38–39, 44, 67–68, 97, 113, 182–83, 194, 312, 317
 on implications of Omalu's findings, 205–6, 314, 321
 Long autopsy results rebutted by, 195–96
 on MTBI Committee, 215, 236
 Omalu's evidence examined by, 205–6, 236, 237
 as Steelers' neurological consultant, 31–32, 35, 37–39, 67
 Webster's CTE diagnosis questioned by, 97–98
 Marshall, Wilber, 71, 72
 Martland, Harrison, 158–59, 191
 Massachusetts General Hospital, 231
 Matson, Ollie, 323
 Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center, 344
 Mawae, Kevin, 129–30, 349
 Michigan, University of, 277
 Miller, Chris, 71
 Miller, Jeff, 277, 278
 Mitchell, Dorothy C., 133
 Mix, Ron, 162
Monday Night Football, 4, 322
 Montana, Joe, 107
 Moon, Warren, 78, 79
 Moore, Bob, 50
 Morgan, Gerry, 135
 Muchnick, Irvin, 245
 Mudd, Howard, 318
 Mullins, Gerry, 26
 Munsell, John, 42, 119
 Hoge's lawsuit against, 118–22, 125, 128–29, 132–34
 Musick, Phil, 15, 16
 National Football League (NFL):
 acknowledgment of brain damage link by, 284–85, 290
 Alzheimer's study commissioned by, 276–77
 brain damage evidence ignored by, 2, 271–72, 273, 276, 280
 brain-injury claims rejected by, 87
 BU Group donation of, 283–84, 287, 301
 collective bargaining agreement of (CBA) of, 272–73
 concussion crisis downplayed by,

74–75, 82, 144–45, 166–68, 174, 197, 322
 concussion policy changes of, 283
 Concussion Summit of, *see* Concussion Summit
 congressional hearings on, 242–44, 277–83, 287, 289–90, 294
 disability plan of, *see* Bert Bell/Pete Rozelle NFL Player Retirement Plan
 88 Plan of, 214–15, 218, 243, 276
 ESPN's contract with, 4, 8, 73
 Hoge's lawsuit and, 121–22
 Luckasevic lawsuit against, 241–42, 272–76, 306–10, 347
 mass tort lawsuit against, 7, 100, 347–48
 mommy bloggers campaign of, 321–22
 neuropsychological testing mandate of, 215, 276, 350
 NIH donation of, 337
 1994 "Season of the concussion" in, 71, 201, 347
 players' increased size and ability in, 71–72
 research spending by, 346–47
 safety campaign of, 322–23
 Seau's brain autopsy and, 8, 334, 335–36, 343
 steroid ban in, 22
 three-day symposium staged by, 349–50
 tobacco industry compared to, 6–7, 244, 280–83
 wealth and power of, 5, 6, 89, 130, 197, 219, 280
 National Heart Institute, 255
 National Hockey League (NHL), 183
 National Institute for Occupational Safety and Health (NIOSH), 349
 National Institutes of Health (NIH), 304
 NFL donation to, 337
 Seau's brain autopsy and, 336, 337, 343
 National Operating Committee on Standards for Athletic Equipment (NOCSAE), 143–44
 Naugle, Rick, 177–78
 Nelson, Craig, 332, 333, 334
 Nelson, Steve, 308
Neurology Today, 217
Neurosurgery, 139, 140, 172–73, 226, 291
 MTBI papers published in, 142–47, 164, 166–67, 170, 171–72, 174–75, 176, 177, 179, 180–81, 220, 276, 289
 Omalu papers published in, 164–65, 188, 189, 197
 peer-review process at, 146–47, 171–72, 181–82
 Riddell helmet study published in, 185–86
 Newhouse, Dave, 351
 New York Giants, 6, 130, 139–40, 220, 227
 New York Jets, 70, 128, 129–30, 131, 145, 175–76, 180
 New York State Athletic Commission, 68
New York Times, 8, 73, 127–28, 176–77, 203, 204, 254, 259, 264, 283, 321
 Johnson story in, 213
 MTBI stories in, 210–11
 NFL brain damage acknowledgment story in, 284–85
 Strzelczyk story in, 234
 Waters story in, 204, 207, 210, 229
 New York University Medical Center, 175, 180
 NFLvolution.com, 323
 NFL Films, 319–20
 NFL Hall of Fame, 3, 56–62, 83, 162
 NFL Head, Neck and Spine Committee (concussion committee), 286–90, 301, 302–3, 304, 335–36, 337, 343–47

NFL Mild Brain Injury Surveillance Study, 132, 139, 144

NFL Mild Traumatic Brain Injury (MTBI) Committee, 75, 79, 122, 126, 130, 159, 203–4, 227, 237, 238, 260, 272, 276, 286

conclusions published by, 6, 145–47, 167–68, 170, 171–72, 174–75, 221, 227

concussion as defined by, 132

in demand for retraction of Omalu paper, 189–92, 196–98

Guskiewicz's research attacked by, 170–71

helmet design and, 134, 136–38, 142–43, 184–87, 211–12

long-term brain damage denied by, 145–47, 167–68, 170, 174–75, 198, 210, 234, 239, 269–71

Lovell and, 125–26

NFL Neuropsychology Program data and, 175, 221

research studies by, 132, 138–39, 142–47, 164, 166–67, 171–72, 174–75, 176–81, 220, 276, 289

NFL Neuropsychology Program, 174–75, 183, 221

NFL Players Association, 38, 68, 115, 244, 284, 290, 292, 300

NFL Retired Players Association, 116

Noderer, Megan, 329

Nolan, Mary, 328

Noll, Chuck, 13, 14, 20, 26, 28, 29, 38, 39, 41, 104, 193, 194, 314

concussion guidelines questioned by, 31–32, 35, 36, 38

Noll, Marianne, 104–5

North Carolina, University of (UNC), 114, 226, 344

Center for the Study of Retired Athletes at, 115, 202, 344, 346

Nowinski, Chris, 201, 202–3, 204, 207, 213, 233, 249, 254, 257, 260, 280, 285, 292, 304

advocacy role of, 198, 201, 229, 230, 263

background of, 198–200, 204

as brain hunter, 201–2, 231, 233–34, 257–58, 304, 330

and BU Group Super Bowl press conference, 263, 264

concussions of, 198, 200–201

Duerson's brain and, 301

Judiciary Committee testimony of, 282

Luckasevic lawsuit and, 274

McHale brain autopsy and, 262–63

at McKee's MTBI presentation, 266–67, 268, 271

and NFL's donation to BU Group, 284

Omalu Group's break with, 252–54, 291

Omalu's relationship with, 198, 201, 202, 229–32, 234, 249–50, 251–52

and Seau's brain autopsy, 333, 335–36

SLI founded by Omalu and, 230–32, 234

Numbers Game, The (Schwarz), 203

Oakland Raiders, 5, 350

Omalu, Bennet, 150–51, 156–57, 198, 205, 207, 234–35, 257, 259, 260, 290–91, 312, 338

background of, 9, 153–54

backlash against, 291–93

Bailes and, 197–98, 205

in break with SLI, 252–54

in call to Fitzsimmons, 105

in conversations with the dead, 9, 152

Davies and, 236–37

as excluded from Concussion Summit, 220, 229

Hamilton as mentor to, 159–60

intellect of, 149, 150, 162

Long's CTE diagnosed by, 194–96

Luckasevic's friendship with, 240–42, 272, 308–9

McHale's brain autopsied by, 262, 264

Maroon and, 205–6

NFL's attacks on, 227, 240–41, 259, 272, 292–93, 333, 335

Nowinski's relationship with, 198, 201, 202, 229–30, 249–50, 251–52

personal belief system of, 149–50

personality of, 149, 150, 160, 162, 291–92

Players Association presentation of, 292

in response to MTBI retraction demand, 189–92, 196–98

and Seau's brain autopsy, 324–25, 330–35

SLI founded by Nowinski and, 230–32, 234

at Steinberg seminar, 232–33

Waters's CTE diagnosed by, 203, 213, 291

Webster autopsied by, 4, 5, 9–10, 151–53, 155–56, 157–58, 159, 194, 207

Wecht as mentor to, 154–55, 164, 260

Omalu, John, 153

Omalu Group, 252–54, 261, 264

competition between BU Group and, 261–62

On Aggression (Lorenz), 319

Oriard, Michael, 5, 320

Otto, Jim, 350–52

Otto, Sally, 351

Pacheco, Mark, 216

Pain of Glory, The (Jim Otto), 351

Parcells, Bill, 129, 145, 208

Parkinson's disease, 159–60

Parrish, Bernie, 244–45, 287

Pash, Jeff, 133, 228, 287, 344

Paterno, Joe, 31

Payton, Connie, 300

Peete, Holly Robinson, 321

Peete, Rodney, 321

Pellman, Elliot, 129–30, 132–33, 145, 226, 266, 276, 345

Barr and, 175–76, 178, 179–80, 221–22

in demand for Omalu paper retraction, 189–92

embellished credentials of, 127–28, 129, 176–77

helmet design project of, 136, 137, 184–87

in Hoge lawsuit, 122, 125, 128–29, 134

as ignorant of brain injury research, 128–29

as lead author on MTBI papers, 142–45, 166–67, 174, 177, 179, 181

Long autopsy results rebutted by, 196

McKee's findings attacked by, 269

as MTBI Committee chairman, 127, 130, 131–32, 137, 142, 144, 174, 181, 204, 270, 286

Omalu attacked by, 227, 335

removed as MTBI Committee chairman, 215

as rheumatologist, 127, 128, 131, 137, 144, 191

Perfetto, Eleanor, 302

Perl, Daniel, 267, 269–70, 271

Perles, George, 14

Perrin, Dave, 114

Peterson, Carl, 50, 93

Pieroth, Elizabeth, 321, 322

Pittsburgh, University of, 34–35

Medical Center at, see University of Pittsburgh Medical Center

Pittsburgh *Post-Gazette*, 36, 61, 97, 194, 195

Pittsburgh Steelers, 1, 2, 20, 21, 23, 55, 112–14, 130, 193

concussion testing and, 38–39

- Pittsburgh Steelers (*continued*):
 full-contact practices of, 26, 41
 Maroon as neurological consultant to, 31–32, 35, 37–39, 67
 Nutcracker drill of, 13–16
 Webster released by, 28
 Webster's growing hatred of, 90–91, 104
 Pittsburgh Steelers Test Battery, 65, 67–68, 97, 112
see also ImPACT
 Plummer, Gary, 79–81, 107, 108, 111, 117, 325, 337–38
 Powell, John, 126
 Pro Bowl, 24
 Proctor, Robert, 341
 ProHEALTH Care Associates, 129
 Prusiner, Stanley, 332, 333, 334, 335
 Punch-Drunk Syndrome (dementia pugilistica), 89, 90, 97, 110, 158–59, 161, 190, 191, 192, 197, 257, 259, 268, 302
 Quarry, Jerry, 216
 Randolph, Chris, 177–78, 312
 Ratzan, Stuart, 275
 Reger, John, 320
 "Relationship between Concussion and Neuropsychological Performance in College Football Players" (Collins), 65–66
 Rice, Harold, 297
 Riddell, 135, 184–85, 223
 false and misleading claims of, 6, 211–12, 315, 316
 FTC investigation of, 315, 317–18
 retired players' suit against, 7
 Revolution helmet of, 184–86, 187, 211–12, 315, 317, 369*n*–370*n*
 UPMC helmet study funded by, 184–86, 316, 317–18
 Ritalin, 3, 55, 60, 83, 86, 89, 94, 95–97, 98
 Rodriguez, Amanda, 322
 Rooney, Art, Jr., 14, 15, 20–21
 Rooney, Art, Sr., 61, 114
 Rooney, Dan, 38, 55, 61, 91, 104
 Rozelle, Pete, 219, 310, 319
 Russell, Andy, 15, 320
 Russomanno, Herman, 275–76, 309
 Sabol, Ed and Steve, 319
 Sanchez, Linda, 279–80, 289
 San Diego Chargers, 325–26
 San Francisco 49ers, 107–8
 Sapp, Warren, 107–8
 Sarmiento, Kelly, 322
 Savran, Stan, 14
 Schickendantz, Mark, 349–50
 Schottenheimer, Marty, 28–29, 50
 Schulten, Katherine, 283
 Schutt, 212, 369*n*–370*n*
 Schwarz, Alan, 213, 215, 226, 227, 234, 260, 264, 276, 283–84
 MTBI stories by, 210–11
 Nowinski and, 203, 254
 Waters story by, 204, 207, 210
 Seau, Gina, 326–27, 328, 333, 337, 338
 Seau, Jake, 327, 339
 Seau, Junior:
 autopsy of, 7, 324–25, 330–35, 343
 CTE diagnosed in, 7, 338–39, 348
 personality change of, 327–28, 338
 suicide of, 7, 324–25, 329–30, 338
 Seau, Sydney, 327, 328–29
 Seau, Tyler, 7, 327, 330–31, 332, 339
 second impact syndrome, 141
 Seifert, George, 107
 Senate Commerce Committee, 315
 NFL retirement system hearing of (2007), 242–44, 277, 294
 sports equipment hearings of (2011), 316–17
 Shakir, Abdulrezak, 155, 194
 Shanahan, Mike, 110
 Shankman, Sabrina, 184
 Shell, Donnie, 41

- Shula, Don, 58–59
 Skipper, John, 8
 Small, Gary, 312
 Smith, Cy, 168
 Smith, DeMaurice, 331
 Sports Brain Guard, 316–17
Sports Illustrated, 75, 128, 216, 255, 319
 Sports Legacy Institute (SLI), 230–32, 234, 250, 259, 274
 brain samples acquired by, 202, 231, 233–34, 249, 257–58
 BU affiliation with, 253, 254–55
 disharmony in, 251–54
 ESPN's piece on, 249–50, 251
see also BU Group
 Stage, Bob, 24, 27, 47–48, 58, 61, 103
 Stallworth, John, 20
 Stautner, Ernie, 318
 Steinberg, Gary, 109
 Steinberg, Leigh, 75–77, 118, 207
 concussion crisis seminars of, 78–79, 80–82, 106, 110, 125, 178, 232–33
 Stern, Bob, 218–19, 254–55, 283, 284
 Stern, David, 74
 steroids, 22, 127, 193, 238–39
 Stingley, Darryl, 73
 Strzelczyk, Justin, 233–34, 295
 suicides, 7, 193–94, 201, 202, 204, 249, 293–95, 310, 324–25, 329–30
 Sullivan, Gerry, 168–69, 366*n*
 Swann, Lynn, 20, 63, 104
 Tagliabue, Paul, 62, 79, 87, 125, 132–33, 210, 215, 218–19, 240, 286
 Apuzzo and, 140, 172
 concussion crisis downplayed by, 74–75, 144
 Pellman and, 127, 128, 131
 statement to ESPN, 131
 Tamarkin, Eric, 278
 Tatum, Jack, 296
 tau protein, 157–58, 224, 225, 235, 255, 256–57, 258–59, 265, 267, 268, 312, 338
 Taylor, Lawrence, 71–72
 Team Webster, 53, 57, 60, 83, 85, 86, 88, 96, 98, 337
 Ted Johnson Rule, 215
 Testaverde, Vinny, 71, 73
They Call It Pro Football (film), 319–20
They Call Me Assassin (Tatum), 296
 Thomas, Derrick, 41
 Tierney, Jack, 275–76
 Tobacco and Health Research Institute, 342
 tobacco industry:
 Harvard Project funded by, 341–43
 link between smoking and cancer denied by, 281–82
 NFL compared to, 6–7, 244, 280–83
 Tomczak, Mike, 63
 Toon, Al, 70, 73, 117
 concussions of, 70–71, 131
 retirement of, 79, 109, 125, 126, 189
 Udall, Tom, 314–16
 United States Football League, 107
 University of Pittsburgh Medical Center (UPMC), 36, 66, 112–13, 149, 154, 174, 183, 194, 312, 313
 helmet study of, 184–87, 211–12, 315, 316, 317–18
 Upchurch, Rick, 323
 Upshaw, Gene, 244–45, 297, 299
 Viano, Dave, 143–44, 210, 211, 221, 227–28, 266, 335
 in demand for Omalu paper retraction, 189–92
 McKee's findings attacked by, 269, 270
 as MTBI Committee cochair, 215, 227, 286
 resignation of, 283, 286
 Virginia, University of, 33, 34
 Vodvarka, James, 85–86, 89, 90, 95–96, 97, 100

Waeckerle, Joe, 222
 Walker, Wayne, 350
 Wallace, Steve, 81
Wall Street Journal, 33, 281
War and Peace in the Global Village (McLuhan), 318
 Warner, Kurt, 347
 Washington, Joe, 299
Washington Post, 80, 215, 350
 Washington State, football safety laws in, 288, 314
 Waters, Andre, 210, 229
 CTE in, 203, 204, 213, 291
 suicide of, 201, 204, 295
 Webster, Betty, 17–18
 Webster, Bill, 17, 19
 Webster, Brooke, 24, 83–84
 Webster, Colin, 17, 23, 58, 83, 86, 91, 95, 96, 101, 104
 Webster, Garrett, 22, 49–50, 54, 102, 103–4, 207, 242–43, 261
 Webster, Joey, 17–18
 Webster, Mike:
 as advocate for brain-damage issues, 94–95
 autopsy of, 2, 4, 5, 9–10, 151–52, 233
 brain disease diagnosed in, 89–90
 as Chiefs' strength and conditioning coach, 50–51
 childhood of, 17–19
 concussions of, 138
 consecutive-play streak of, 27
 constant pain of, 49
 death of, 104, 148, 207–9, 295
 deep-seated fear as motivator of, 24, 26–27, 28
 disability case of, 87–92, 95, 98–101, 168
 divorce of, 54
 elected to Hall of Fame, 56–58
 erratic behavior of, 3, 10, 29–30, 47, 48–51
 and family history of mental illness, 17
 financial problems of, 47, 48–49, 54
 in first training camp, 13–16
 Fitzsimmons's friendship with, 89, 92, 94, 96, 105
 forged prescription arrest of, 95–97, 98
 growing hatred of Steelers and NFL expressed by, 90–91, 104
 at Hall of Fame induction, 3, 58–62, 83
 headaches of, 26
 head injuries as unreported by, 26
 head used as battering ram by, 25
 heart attack as cause of death of, 10, 148
 heart disease of, 103–4
 intensity of, 19–20, 21
 Jani and, 51–54, 57–58, 85, 94, 103–4
 Kansas City house of, 29–30, 47, 48
 letters of, 91–93, 102–3
 mental and physical deterioration of, 3, 53, 54–55, 57, 84, 85–86, 90, 91, 101–3
 NFL lawsuit of, 101, 168–70, 192
 in 1974 Steelers draft, 20
 in Nutcracker drill, 15–16
 Otto and, 352
 paranoia of, 50, 61, 90–91
 pills and supplements taken by, 22–23, 84, 86
 as prankster, 23
 Pro Bowl appearances by, 24
 psychiatric exams of, 89–90
 religious beliefs of, 16–17
 retirement of, 29, 47
 Ritalin addiction of, 3, 55, 60, 83, 86, 89, 94, 95–97
 Stage and, 47–48, 61
 steroid use by, 22
 stun guns owned by, 84–85
 Super Bowl rings of, 52, 94
 training regimen of, 19, 21–22
 at University of Wisconsin, 19–20

unrealistic business plans of, 48, 56, 58, 83
 weapons owned by, 3, 84–85, 91
 Westbrook's examination of, 98–99
 Webster, Mike, brain of:
 Alzheimer's brain vs., 158, 161
 beta-amyloid plaque in, 158
 CTE diagnosed in, 207, 338
 DeKosky's examination of, 162–63
 Hamilton's examination of, 160–61
 normal external appearance of, 10, 152
 Omalu's autopsy of, 157–58, 159, 194
 Omalu's decision to preserve, 10, 152–53, 155–56
 Omalu's paper on, 163–65, 188–92, 202, 215, 257
 tau buildup in, 157–58, 235
 Webster, Pam, 20, 21, 24, 26, 29, 50, 54, 60, 104–5, 168
 Mike's erratic behavior and, 29–30, 47, 48–49
 at Webster's Hall of Fame induction, 61
 Webster, Reid, 18, 19
 Wecht, Cyril, 152–53, 154–55, 160, 164, 194–96, 260
 Weiner, Anthony, 290
 Wenzel, Ralph, 302
 Werley, Jonette, 156
 Westbrook, Edward, 98–99, 169
 West Chester University, 171
 White, Reggie, 40
 Widmeyer Communications, 250
 Wiley, Clayton, 205
 Wilkinson, Bud, 13
 Williams, Aeneas, 108
 Wilson, Otis, 296
Winning with Integrity (Steinberg), 76
 Wisconsin, University of, 19–20
 Withnall, Chris, 184
 Wolfley, Craig, 22
 Woodard, John, 177–78
 woodpeckers, brains of, 1, 2
 workers' compensation, former players' claims for, 306–7
 World Class Expeditions, 258
 Worley, Tim, 41–42
 Woschitz, Frank, health survey of, 68, 69, 113, 114
 Wynder, Ernst, 281, 283, 341
 Yates, Tony, 64, 126, 145, 221–22
 Young, Barbara Graham, 108, 111
 Young, Steve, 79, 171
 background of, 106–7
 concussions of, 107–12, 167, 283, 337–38
 retirement of, 111, 112
 Youngblood, Jack, 292
 "Youth Health & Safety Luncheon," 321–22
 Zackery Lystedt Law, 288, 314
 Zamorano, J. R., 71, 77
 Zegart, Dan, 281, 341, 342

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